

Indian Explosives Act (IV of 1884)
Indian Petroleum Act (VIII of 1899)

TWENTY-NINTH ANNUAL REPORT
OF THE

Chief Inspector of Explosives
in India

Being the Annual Report for the year ending 31st March 1926.



GOVERNMENT OF INDIA
CENTRAL BUREAU OF INVESTIGATION

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zines in one place under one license. The number of licenses and of magazines is less than that in 1926. The decrease is mainly due to the non-renewal of the licenses hitherto taken out by Railway Companies for the possession of explosives as the Government of India are of opinion that by virtue of the powers conferred on it by Section 7 (1) (f) of the Indian Railways Act, 1890, it is not necessary for a Railway Company to take out a license for the possession of explosives if as a matter of fact such possession is necessary for making, maintaining, etc., the railway. A statement showing the number and location of the magazines and also the number of licenses granted in British India during the year 1927 is given in Appendix A, and a statement showing the number of magazines and licenses granted during the past ten years is shown in Appendix B.

4. During the year, 320 inspections of magazines were made; a number of magazines being inspected two or three times. Those magazines are inspected most frequently which are situated in the neighbourhood of towns or in populous localities, or which contain large quantities of explosives, or any explosive which on account of its greater susceptibility to decomposition and possible ignition, it is considered advisable to examine and test more frequently than other explosives.

5. The magazines generally are in good order, and as usual magazine-owners have been found most willing to carry out recommendations even when involving considerable expense, and my thanks are due to them for making my duties easy in this respect.

6. The physical condition of all the explosives in the different magazines during the year was found to be good with the following exceptions which were found to have become defective and were destroyed —

- | | |
|--|---|
| <p>(a) 84½ lbs of Gelignite
113½ Detonators</p> <p>(b) 35 loose sticks of Dynamite and 93 of Gelignite from the magazine of the Bombay Improvement Trust at Koliwada.</p> <p>(c) 210 coils of safety fuse from the magazine of Mr. Gulam Akbar Musakhani at Raipuri.</p> <p>(d) 59 Electric Detonators from the magazine of the Paripat Colliery at Paripat.</p> | <p>} from the P. W. D. magazine
} at Mangla</p> |
|--|---|

Thefts.

7. During the year under report no case of theft of explosives was reported to this office.

8. Two thousand eight hundred and sixty-five tons of explosives were imported into British India during the year 1927, the value being Rs 22,37,116. Full details showing the different kinds of explosives imported, and the value of each are given in Appendix C. A comparative statement showing the quantity of explosives imported during the last 10 years is given in Appendix D.

9. A list of explosives at present authorised for importation into British India was published in the *Gazette of India* for information and is given in Appendix E.

10. Two licenses granted by the Governor General in Council for the manufacture of explosives in the Central Provinces were renewed during the year.

11. To prevent a number of accidents which occur yearly near coal mines during the manufacture of crude gunpowder, it is exceedingly desirable that some responsible firms should start gunpowder factories in India. It is much to be regretted that none have as yet approached this Department with definite proposals on the subject.

Petroleum.

12. During the year under report, 5,154 licenses for the storage of dangerous and non-dangerous petroleum, regarding which this Department was concerned or consulted, were granted. A list of these premises, collected up to 31st December 1927 and showing the districts in which they are located, is given in Appendix F.

13. A large number of special licenses have been granted under Rule 6, Chapter IV, Part II of the rules for the storage of dangerous petroleum in underground tanks with Kerbside pumps under the Bowser and similar systems.

A large number of minor installations for the storage of dangerous petroleum in bulk erected on plans approved by this Department has been taken into use.

14. In all 1,573 inspections of petroleum premises were made.

15. The large petroleum installations are usually under efficient European supervision and are in good order and well looked after.

16. The small or minor petroleum installations are installations in which not more than 50,000 gallons of kerosene oil or liquid fuel in combined bulk and non-bulk are stored. These are looked after by Indian Agents employed by the large oil firms. The oil for these installations is supplied from the major installations at the different ports, and the retail trade is carried out in them. A great deal of inspection of these minor installations has been done by this Department with the result that their condition is very much improved and the vast majority of them are in very good order.

Accidents.

17. A list of accidents, with a short account of each, that have occurred with explosives, inflammable substances, dangerous goods, etc., between the 1st January and 31st December 1927 is given in Appendix G. It will be seen from a perusal of the details that the accidents have practically all been caused by gross neglect of ordinary precautions. In all there were 54 accidents causing 36 deaths and injuries to 88 persons. Comparative statements given in Appendices I and J show the total number of accidents and the number of persons killed or injured by them during the last ten years. As stated in previous reports it is very doubtful whether all accidents that occur are duly reported to this Department and, therefore, it is very possible that the statistics given are underestimated.

As a rule the only accidents that are entered in Appendix G are those which cause loss of life or injuries or are important from some point of view.

- | | |
|-----------------------------|---|
| Gunpowder, Class I. | 18. There were eight accidents from gunpowder during the year, causing five deaths and injuries to seven persons. |
| Nitro-compounds, Class III. | 19. There were two accidents from nitro-compounds during the year, causing eight deaths and injuries to eighteen persons. |
| Chlorate Mixture, Class IV | 20. No accidents from explosives classed as Chlorate mixtures were reported during the year. |
| Fulminates, Class V. | 21. Six accidents from fulminates, causing one death and injuries to twenty-two persons were reported during the year. |
| Ammunition, Class VI. | 22. There were three accidents from ammunition, causing one death and injuries to four persons. |
| Fireworks, Class VII | 23. Twenty-three accidents from fireworks caused sixteen deaths and injuries to twenty persons. |
| Petroleum. | 24. There were nine accidents from petroleum during the year, which were responsible for five deaths and injuries to eight persons. It will be seen from a perusal of the accidents in Appendix G that carelessness is a prominent feature in most of them. In India the petroleum accidents are caused usually by naked lights being brought into proximity to oil vapour. |
| Chemicals | 25. A number of fires were reported to this office as having occurred during the year in the Burma Oil Fields. |
| Miscellaneous, | 26. Two accidents from chemicals causing injuries to nine persons were reported during the year. |
| | 27. There was only one accident. |

28. On the 13th October 1927 an explosion occurred at Kyauktalon (Burma) stone quarry resulting in the death of six persons and injuries to eighteen others. An enquiry into the cause of the explosion was made by me at the request of the Government of Burma. My report No. G-4(117), dated 2nd November 1927 to the Government of Burma is given in Appendix K.

29. On the 15th December 1927 an explosion occurred at mile 74 Central India Coalfields Railway near Hindigir as a result of which two men were seriously injured. An enquiry into the cause of the accident was made by Mr P. W. Alloway, F. C. S., Inspector of Explosives. The explosion was due to one of the Detonators which were being counted by two men from a pile and thrown into another pile as counted having been dropped.

General Remarks.

30. Nineteen reports of inspection of these magazines by civil officers have been received in this office, and I have brought to the notice of the Government Magazines in charge officers concerned any irregularities or defects which required remedying. There is no doubt

that the introduction of this system of sending these reports to this office has been desirable. I have come across a good many instances of ignorance and want of expert knowledge, which might have caused disasters. High explosives in these magazines had previously never been tested, and I have in dealing with these reports, always recommended that samples of these explosives should be sent at least once a year to Chemical Examiners for test.

31. Three Railway magazines were inspected by this Department during the year.

32. The license to manufacture and possess in a Factory, The Fireworks containing Fulminate of Silver granted to Messrs. Bonbonniere, Limited, Calcutta, was renewed during the year. The maximum quantity of free explosive allowed in the Factory at any one time is limited to 2½ grains.

33. The Government of India amended clause (1) of rule 3 of the Indian Explosives Rules, 1914, so as to exempt "Snaps when contained in fully manufactured Christmas or bon-hon crackers" and "coloured matches known as Bengal lights" from the provisions of the said rules.

The Government of India also amended rule 12 of the Indian Explosives Rules by inserting "British Corbin" in the list of Ports into which importation by sea is permitted and by deleting the word "Corbin" from clauses (b) and (c) of proviso (1).

The Government of India also amended clause (1) of the proviso to rule (27) and entry No. 9 in Schedule II to the Indian Explosives Rules and made certain amendments in the conditions endorsed on forms D, F, J and L and substituted the existing form E by two distinct forms in Schedule III to the said rules in order to require licensees to show their stock books and records to inspecting officers and to reduce the quantity of gunpowder for which Magistrates of the 1st and 2nd class can grant licenses. They also amended conditions 8 and 5 of forms J and K respectively in Schedule III by adding a further proviso with regard to the fee for testing lightning conductors attached to one and the same magazine.

34. The Government of India sanctioned amendment of rule (o) of the rules to regulate the landing and shipment of explosives at the Port of Madras regarding signals to be used at the port.

35. The Government of India issued a notification prohibiting the manufacture, possession and importation of any explosive consisting of or containing sulphur in admixture with chlorate of potassium or any other chlorate except when required for scientific purposes or for the manufacture of heads of safety matches.

36. A new type of Detonator known as "Lead Azide Detonator" having an aluminium capsule was permitted to be imported into British India. I also agreed to its use in any mine or quarry where the use of a "permitted" explosive was not compulsory.

37. In reply to an enquiry, I have stated that "Tartary", "Pottumia", "Martineau" or "Martineau" come under the definition of Manufactured fireworks, Class VII, Division 2 and their importation into India is not prohibited.

38. The Government of Bengal issued a notification limiting the quantity of paper caps for toy pistols for the purpose of manufacture, possession, sale, packing, transport or importation at any one time to three dozen boxes of 100 caps each or six dozen boxes of 50 caps each.

39. The Lightfoot Refrigeration Co. Limited, Bombay, carried out experiments with Liquid Oxygen Explosives at Mettur. I was present to witness the demonstration on the 7th and 8th June 1927.

40. In reply to an enquiry relating to the weight of a firework, I have stated that the weight of a firework includes the weight of the whole article, paper, clay, etc., complete.

41. The Government of India sanctioned amendment of rule 7, Chapter I, Petroleum Rules, Part II of the Petroleum Rule in force in the Central Provinces and Berar so as to empower any inspecting officer to call for the record of tests of electric connections and contacts of petroleum tanks.

42. The Government of India issued a notification applying all the provisions of the Indian Petroleum Act to Acetone, Wood Naptha and Methyl Alcohol. They at the same time directed Local Governments and Administrations that the rules regulating the importation, possession and transport of petroleum issued by Local Governments and Administrations should apply *mutatis mutandis* to the importation, possession and transport of these substances.

43. The Government of Bengal added a new condition to the conditions endorsed on forms F, H, K, L, and I, of the Petroleum Rules with regard to the closing of receptacles containing dangerous petroleum with humps, plugs or caps of either metal, wood or strawboard as soon as they are emptied of their contents.

44. The Government of Madras delegated to District Magistrates and the President, Corporation of Madras, the power to grant special licences under rule 6, Chapter IV, Part II of the Petroleum Rules for the possession of dangerous petroleum otherwise than in bulk in quantities not exceeding one thousand gallons.

45. With reference to an enquiry I have advised the Postal Department that Turpentine is an inflammable liquid and as such it comes under the category of "Articles not transmissible by Post."

46. As required by rule 7, Chapter I, Part II of the Petroleum Rules I drew up and issued to Local Governments and Administrations instructions for testing electric earths attached to petroleum tanks. A copy of the instructions will be found in Appendix L.

47. This Department was consulted with regard to the revision of Chapter III, Part II of the General Rules for working open lines of railway in British India.

48. This Department was also consulted regarding the conveyance of "Petroleum" and "Flit" by rail.

49. A very large number of enquiries of a varied nature was received during the year from District Officials, private individual, firms, Port authorities and Railways. Those were all dealt with.

50. I was consulted by the Indian Railway Conference Association in connection with numerous amendments and additions to the rules contained in the Red Pamphlet No. 7 (Rules and Rates for the conveyance of explosives and other Dangerous Goods by Rail). A new Red Pamphlet No. 8 has recently been issued.

51. The number of Inspections done by this Department during the year were 2,093. To give some idea of the work and the ground covered, I give the following details of the work done by the Inspectors of Explosives.

During the 12 months, 1st April 1927 to 31st March 1928, the Inspectors at Calcutta and Poona were away from head-quarters for 151 and 267 days and travelled 32,779 and 35,799 miles, respectively.

The Chief Inspector of Explosives was on tour for 132 days, travelled 20,137 miles, and inspected 67 explosives magazines and 250 petroleum premises, and went on inspection duty to the Burma and Assam Oil Fields and visited the ports of Calcutta, Madras, Bombay, Aden, Rangoon and Muttagong. The Chief Inspector was either summoned or on duty connected with criminal cases for 21 days.

52. This office is now permanently located in Calcutta at No. 1, Council House Street.

I have the honour to be,

SIR,

Your most obedient Servant,

N. I. SHIELDON,

Chief Inspector of Explosives in India

APPENDIX A.

List of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II of the Indian Explosives Rules, 1914, for the year 1927.

Presidency or Province	District	MAGAZINES.			LICENSES.		
		Under renewed license	Under new license	TOTAL.	Renewed	New	TOTAL.
Assam	Kamrup . .	1	...	1	1	...	1
	Lakhimpur . .	1	2	3	1	2	3
	Naga Hills . .	1	..	1	1	...	1
	TOTAL	3	2	5	3	2	5
Bengal	Burdwan . .	11	...	11	8	...	8
	Culcutta . .	1	..	1	1	...	1
	Darjeeling	2	...	2	2	..	2
	Hooghly . .	4	...	1	1	...	1
	24-Parganas	2		2	1	.	1
	TOTAL	20	..	20	13	...	13
Bihar and Orissa	Gaya . .	3	...	3	3	.	3
	Hazarbagh . .	12	..	12	6	.	6
	Manbhum . .	20	...	20	20	..	20
	Sambalpur	1	..	1	1	..	1
	Santal Parganas	3		3	3	.	3
	Singbhum	10	...	10	8	...	8
	TOTAL	58	...	58	40	.	40

APPENDIX A—contd.

List of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II of the Indian Explosives Rules, 1914, for the year 1927—contd.

Presidency or Province.	District.	MAGAZINES.			LICENSES.		
		Under renewed license	Under new license	TOTAL	Renewed	New.	TOTAL
Bombay	Aden . .	1	3	4	1	3	4
	Ahmedabad . .	5	..	5	5	..	5
	Bombay . .	17	1	18	12	1	13
	Breach . .	1	..	1	1	..	1
	Karnul . .	6	..	6	3	..	3
	Kolaba . .	1	..	1	1	..	1
	Panch Mahals . .	1	..	1	1	..	1
	Poona . .	4	1	5	4	1	5
	Retunqiri . .	2	..	2	2	..	2
	Sera . .	2	..	2	2	..	2
	Thana . .	1	..	1	1	..	1
	West Khandesh . .	..	1	1	..	1	1
TOTAL . .		41	6	46	33	6	39
Burma	Amherst . .	1	..	1	1	..	1
	Bassein . .	2	..	2	2	..	2
	Henthawaddy . .	4	..	4	2	..	2
	Katho . .	1	..	1	1	..	1
	Mague . .	1	..	1	1	..	1
	Mergui . .	2	..	2	2	..	2
	Myittha . .	1	..	1	1	..	1
	Northern Shan States . .	8	1	9	4	1	5
	Pegu . .	1	..	1	1	..	1
	Tavoy . .	6	..	6	4	..	4
	Thabe . .	6	..	6	5	..	5
	Toungoo . .	1	..	1	1	..	1
TOTAL . .		34	1	35	25	1	26

APPENDIX A—contd

List of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II of the Indian Explosives Rules, 1911, for the year 1927—contd.

Presidency or Province	District.	MAGAZINES.			LICENSES		
		Under renewed license	Under new license	TOTAL	Renewed	New.	TOTAL.
Central Provinces	Anraoti .	1	.	1	1	.	1
	Balaghat .	7	...	7	7	.	7
	Bhandara .	2	...	2	2	.	2
	Bilaspur .	1	..	1	1	.	1
	Chanda .	5	..	5	4	...	4
	Chhindwara .	1	..	4	1	..	4
	Jubbulpur .	1	1	2	1	1	2
	Nagpur .	8	...	5	5	.	5
	Raipur .	3	..	3	4	..	4
	Tecmal .	1	.	1	1	...	1
	TOTAL	23	1	34	33	1	34
Coorg . . .	Merrara . .	1	..	1	1	..	1
	TOTAL	1	...	1	1	..	1

APPENDIX A—*conold.*

List of Magazines and Licences granted under Rule 46 and items 10 and 11 of Schedule II of the Indian Explosives Rules, 1913, for the year 1927—conold.

Presidency or Province.	District.	MAGAZINES			LICENCES.		
		Under renewed licence	Under new licence	TOTAL	Renewed	New	TOTAL.
Madras	Anantapur	2	...	2	2	...	2
	Bellary	1	..	1	1	...	1
	Chingleput	2	...	2	2	...	2
	Chittoor	2	...	2	2	...	2
	West Godwari	1	..	1	1	...	1
	Madras	13	.	13	6	...	6
	Madurai	2	.	2	2	...	2
	Nellore	4	...	4	2	...	2
	North Arcot	2	..	2	2	.	2
	Ramanad	...	1	1	...	1	1
	Salem	1	...	1	1	...	1
	South Arcot	4	...	4	4	..	4
	Tanjore	14	...	14	14	...	14
	Tinnevely	1	...	1	1	...	1
	Trichinopoly	3	...	3	3	..	3
	Viragapattam	4	...	4	3	...	3
TOTAL		56	1	57	46	1	47
Punjab	Attock	...	1	1	...	1	1
	Shahpur	...	1	1	...	1	1
	TOTAL	...	2	2	...	2	2
United Provinces	Meerut	1	..	1	3	...	3
	Shahjahanpur	1	...	1	1	...	1
	TOTAL	2	...	2	4	..	4

SUMMARY.

Provinces or Province	MAGAZINES			LICENSES		
	Under renewed license	Under new license	TOTAL	Renewed	New	TOTAL
Azam . . .	3	2	5	3	2	5
Bengal . . .	50	..	50	13	..	13
Bihar and Orissa . .	58	.	58	49	..	49
Bombay . . .	40	6	46	33	6	39
Burma . . .	31	1	32	25	1	26
Central Provinces . .	33	1	34	31	1	34
Coorg . . .	1	..	1	1	..	1
Malwa . . .	50	1	51	16	1	17
Punjab . . .	..	2	2	..	2	2
United Provinces . .	3	..	3	4	..	4
TOTAL .	247	13	260	207	13	220

APPENDIX B.

Summary of Magazines and Licenses granted under Rule 46 and items 10 and 11 of Schedule II for the 10 years ending 1927.

YEAR	MAGAZINES			LICENSES		
	Under renewed license	Under new license	TOTAL	Renewed	New	TOTAL
1918 . . .	239	15	254	183	10	193
1919 . . .	232	14	246	180	9	189
1920 . . .	237	8	245	180	6	186
1921 . . .	227	24	251	180	25	205
1922 . . .	234	20	254	190	19	209
1923 . . .	245	13	258	190	13	212
1924 . . .	247	31	278	204	26	230
1925 . . .	243	16	259	214	14	228
1926 . . .	264	19	283	214	18	232
1927 . . .	247	13	260	207	13	220

APPENDIX C.

Statement showing the imports of explosives by sea into British India from other countries in the year 1927.

Explosives.	Bengal.	Bombay	Sind.	Burma.	Madras	TOTAL
<i>Quantity.</i>						
Gunpowder, black lbs.	115,607	13,850	—	10,870	10,150	178,550
" smokeless "	18,100	1,393	—	—	1,766	21,238
Dynamite . "	259,000	20,760	—	36,000	10,000	364,760
Blasting gelatine "	20,000	12,500	—	3,000	276,000	271,500
Gellynite or gelatine dynamite "	217,000	251,600	—	214,000	241,500	924,000
Other nitro-compound explosives "	120,000	—	—	—	25	120,025
Detonators . No.	2,101,030	1,796,024	—	1,037,000	2,473,121	6,810,499
Wires . lbs.	266,266	2,084,140	36,351	120,041	277,867	3,610,679
TOTAL . "	1,074,056	2,087,924	36,351	201,892	837,915	5,729,742
TOTAL . No.	2,301,050	1,336,024	...	1,037,000	2,473,121	6,810,498
<i>Value in rupees.</i>						
Gunpowder, black .	76,439	17,620	—	6,767	7,271	107,902
" smokeless .	37,401	5,816	—	—	2,867	45,994
Dynamite . .	187,102	14,600	—	60,801	30,124	292,731
Blasting gelatine .	17,154	10,910	—	5,010	212,057	237,031
Gellynite or gelatine dynamite .	157,080	187,731	—	331,957	146,217	898,555
Other nitro-compound explosives .	87,067	—	—	—	107	87,174
Detonators . .	71,091	25,138	—	51,111	37,180	185,666
Wires . .	207,037	817,073	28,672	180,170	180,601	1,414,133
TOTAL .	846,011	1,071,701	28,672	639,279	610,160	3,237,110

APPENDIX D.

Comparative statement showing the imports of explosives by war into British India from other countries for the ten years ending 1927.

Explosives.	1919	1919	1920	1921	1922	1923	1924	1925	1926	1927
Guncotton, black . . lbs.	62,700	1,11,070	217,730	91,710	126,875	121,850	310,895	561,225	200,110	174,550
" " " " " "	2 0,605	77,425	8,350	21,400	18,116	15,173	30,107	17,137	23,250	41,238
Dynamite "	218,091	111,665	707,101	533,000	275,000	331,270	708,122	574,701	315,200	394,750
Blasting gelatin "	21,972	74,752	677,000	102,700	240,100	613,250	480,000	127,771	210,050	271,600
Cellulose or sulphate dynamite . . "	1,025,670	881,781	325,925	409,112	143,750	111,725	401,500	1,000,200	661,770	924,001
Other nitro compound explosives . . "	171,214	140,157	201,780	157,180	111,272	240,777	..	50,350	75,250	150,025
Detonators No.	4,780,812	5,450,204	3,775,500	3,674,702	2,475,057	3,700,380	4,115,050	6,881,021	6,242,576	9,950,108
Fuzes lbs.	1,102,007	1,271,131	2,762,185	3,710,877	7,579,851	1,201,499	3,700,031	3,745,772	1,070,950	1,910,078
Total	2,710,222	2,000,575	1,311,393	5,022,460	1,284,136	6,111,776	5,680,719	5,911,509	6,265,676	6,723,712
Total No.	4,780,812	5,450,204	2,762,185	3,710,877	7,579,851	3,700,380	4,115,050	6,881,021	6,242,576	9,950,108

APPENDIX E.

DEPARTMENT OF EXPLOSIVES.

NOTIFICATION.

Calcutta, the 16th April 1928.

No. E-II (1).—With reference to the following Notifications publishing rules to regulate the manufacture, possession, sale, transport and importation of explosives, the following list of " Authorised Explosives " referred to in the rule mentioned against each Notification is published for general information :—

Rule 4 (3) of Notification No 4013—33, dated the 6th June 1914, of the Government of India, Department of Commerce and Industry.

Rule 4 (3) of Notification No. 1183, dated the 11th November 1914, of the Chief Commissioner, Central Provinces, applicable to Berar.

Rule 4 (3) of Notification No. 14, dated the 23rd April 1915, of the Resident in Mysore applicable to the Civil and Military Station of Bangalore and on the Railways in Mysore under British Jurisdiction.

Rule 4 (3) of Notification No. 67-J., dated the 28th August 1914,	} of the Resident at Hyderabad applicable to the Cantonments of Secunderabad and Aurangabad, the Hyderabad Residency Buzars and the Railway lands in the Hyderabad State.
Rule 4 (3) of Notification No 34-J., dated the 20th April 1915,	

Rule 3 (3) of Notification No. 99, dated the 19th July 1916. of the Government of Burma applicable to the Northern Shan States.

Rule 3 (3) of Notification No. 5313, dated the 29th October 1918, of the Agent to the Governor General in Rajputana

Rule 3 (3) of Notification No. 1812-B., dated the 10th November 1919, of the Agent to Governor General in Central India, applicable to Railway lands in Central India, specified in the Notification of the Government of India in the Foreign Department No. 261-J. B., dated 10th February 1913.

LIST OF AUTHORISED EXPLOSIVES.

The following explosives are at present authorised for importation into British India for general sale.—

CLASS 1.—GUNPOWDER.

The term " gunpowder " means gunpowder ordinarily so called.

GUNPOWDER.

CLASS 2—NITRATE MIXTURE.

The term "nitrate mixture" means any preparation, other than gunpowder ordinarily so called, formed by the mechanical mixture of a nitrate with any form of carbon or with any carbonaceous substance not possessed of explosive properties, whether sulphur be or be not added to such preparation, and whether such preparation be or be not mechanically mixed with any other non-explosive substance, and includes any explosive containing a perchlorate and not being a chlorate-mixture, fulminate or nitro-compound as defined in Rule 1 of the Indian Explosives Rules, 1914.

EVERY BLASTING EXPLOSIVE IN THIS CLASS, IN WHICH NITRATE OF AMMONIUM, NITRATE OF SODIUM OR CHLORIDE OF SODIUM ARE USED AS INGREDIENTS, SHALL BE CONTAINED IN CARTRIDGE WRAPPERS OR CASES (OR IN FIVE-POUND INNER PACKAGLS) MADE THOROUGHLY WATERPROOF WITH MELTED PARAFFIN OR OTHER SUITABLE WATERPROOFING MATERIAL.

BOBBINITE.

CLASS 3—NITRO-COMPOUND.

The term "nitro-compound" means any chemical compound possessed of explosive properties, or capable of combining with metals to form an explosive compound, which is produced by the chemical action of nitric acid (whether mixed or not with sulphuric acid) or of a nitrate mixed with sulphuric acid upon any carbonaceous substance, whether such compound is mechanically mixed with other substances or not.

The nitro-compound class has two divisions.

EVERY EXPLOSIVE IN THIS CLASS AND EVERY EXPLOSIVE INGREDIENT THEREOF SHALL BE SO THOROUGHLY PURIFIED AND OTHERWISE OF SUCH CHARACTER AS TO SATISFY A TEST KNOWN AS THE HEAT TEST, AND SPECIFIED IN THE RULE FOR TESTING EXPLOSIVES PUBLISHED WITH GOVERNMENT OF INDIA, DEPARTMENT OF COMMERCE AND INDUSTRY, NOTIFICATION NO 4013—83, DATED THE 6TH JUNE 1914, REFERRED TO ABOVE.

EVERY BLASTING EXPLOSIVE IN THIS CLASS, IN WHICH NITRATE OF AMMONIUM, NITRATE OF SODIUM, CHLORIDE OF SODIUM OR NITRO-GLYCOL ARE USED AS INGREDIENTS, SHALL BE CONTAINED IN CARTRIDGE WRAPPERS OR CASES (OR IN FIVE-POUND INNER PACKAGLS) MADE THOROUGHLY WATERPROOF WITH MELTED PARAFFIN OR OTHER SUITABLE WATERPROOFING MATERIAL.



DIVISION 1.

Division 1 comprises the following explosives and any chemical compound or mechanically mixed preparation which consists either wholly or partly of nitro-glycerine or of some other liquid nitro-compound.—

Ardeer Gelignite.		Dynamite.	
Arkite.	}	Dynobel No. 2.	
Samsonite.		Dynobel (Export) No. 3.	}
Samsonite.		Dynobel No. 3.	
A. 2. Monobel	}	Dynobel No. 4.	
Viking (Export) No. 1.		Farmer's Dynamite.	
Viking (Export) No. 2.		Gelatine Dynamite	
Viking Powder No. 1		Gelignite.	
Viking Powder No. 2.		Monobel, No. 1.	
Ballistite.		Nacota Powder.	}
Blasting Gelatine		Chilworth Smokeless	
Cambrite		Powder No. 2.	
Chilworth Smokeless Powder	}	Arkite.	}
No. 2.		Samsonite	
Nacota Powder.		Samsonite.	
Cordite.		Stonobel.	
Cordite, M. D.		Victor Powder No. 2.	

PROVIDED THAT EVERY EXPLOSIVE IN THIS DIVISION SHALL BE OF SUCH CHARACTER AND CONSISTENCY AS NOT TO BE LIABLE TO LIQUEFACTION OR LEADATION.

PROVIDED ALSO THAT AN EXPLOSIVE WHICH IS REQUIRED BY DEFINITION TO BE ISSUED IN WATERPROOF INNER PACKAGS MAY BE EXEMPTED FROM SUCH REQUIREMENT BY SPECIAL AUTHORITY, WHEN AND SO LONG AS THE CONDITIONS OF SUCH AUTHORITY ARE OBSERVED.

DIVISION 2

Division 2 comprises the following explosives and any nitro-compound as before defined which is not comprised in division 1 —

Alumatol.	}	Guncotton.	
Ammonal.		Negro Powder No. 2.	
Amberite, No. 2.		N. S. Smokeless	
Di-nitro-phenol.		Picric Acid.	
Economix Smokeless Sporting	}	Picric Powder.	
Powder.		Roburite No. 1.	
E. C. Sporting Powder.	}	Ruby Powder	
Eley Smokeless Sporting Pow-		Schultze Gunpowder.	
der.		Smokeless Diamond.	
Empire Powder	}	Tamite or Cotton Powder.	
Light Load Smokeless.		Tri-nitro-toluol.	
Ideal Powder.			
Nobel's Special Powder			

CLASS 4—CHLORATE MIXTURE.

The term "chlorate mixture" means any explosive containing a chlorate

The chlorate mixture class has two divisions

EVERY EXPLOSIVE IN THIS CLASS AND EVERY EXPLOSIVE INGREDIENT THERE-OF SHALL BE SO THOROUGHLY PURIFIED AND OTHERWISE OF SUCH CHARACTER AS TO SATISFY A TEST KNOWN AS THE HEAT TEST, AND SPECIFIED IN THE RULE FOR TESTING EXPLOSIVES PUBLISHED WITH GOVERNMENT OF INDIA, DEPARTMENT OF COMMERCE AND INDUSTRY, NOTIFICATION No. 4013—33, DATED THE 6TH JUNE 1914, REFERRED TO ABOVE.

EVERY BLASTING EXPLOSIVE IN THIS CLASS, IN WHICH NITRATE OF AMMONIUM, NITRATE OF SODIUM OR CHLORIDE OF SODIUM ARE USED AS INGREDIENTS, SHALL BE CONTAINED IN CARTRIDGE WRAPPERS OR CASES (OR IN FIVE-POUND INNER PACKAGES) MADE THOROUGHLY WATERPROOF WITH MELTED PARAFFIN OR OTHER SUITABLE WATERPROOFING MATERIAL.

DIVISION 1.

Division 1 comprises any chlorate preparation which consists partly of nitro-glycerine or of some other liquid nitro-compound.

Nil

PROVIDED THAT EVERY EXPLOSIVE IN THIS DIVISION SHALL BE OF SUCH CHARACTER AND CONSISTENCY AS NOT TO BE LIABLE TO LIQUEFACTION OR EXUDATION

DIVISION 2.

Division 2 comprises any chlorate mixture as hereinbefore defined, which is not comprised in Division 1.

Nil.

CLASS 5—FULMINATE

The term "fulminate" means any chemical compound or mechanical mixture, whether included in the foregoing classes or not, which, from its great susceptibility to detonation, is suitable for employment in percussion caps or any other appliances for developing detonation, or which, from its extreme sensibility to explosion, and from its great instability (that is to say, readiness to undergo decomposition from very slight exciting causes), is especially dangerous

This class consists of two divisions

DIVISION 1.

Division 1 comprises such compounds as the fulminates of silver and of mercury, and preparations of those substances, such as are used in percussion caps; and any preparation consisting of a mixture of a chlorate with phosphorus or certain descriptions of compounds of phosphorus, with or without the addition of carbonaceous matter, and any preparation consisting of a mixture of a chlorate with sulphur, or with a sulphuret, with or without carbonaceous matter

Nil.

DIVISION 2.

Division 2 comprises such substances as the chloride and the iodide of nitrogen, fulminating gold and silver, diazobenzol, and the nitrate of diazobenzol.

Nil.

CLASS 6.—AMMUNITION.

The term "ammunition" means any explosive of any of the foregoing classes when the same is enclosed in any case or contrivance, or is otherwise adopted or prepared so as to form a cartridge or charge for small-arms, cannon or any other weapon, or for blasting or to form any safety or other fuze for blasting or for shells, or to form any tube for firing explosives or to form a percussion cap, detonator, fog-signal, shell, torpedo, war-rocket, or any other contrivance other than a firework.

*The term "percussion cap" does not include a detonator.**

The term "detonator" means a capsule or case which is of such strength and construction and contains fulminate in such quantity, that the explosion of one capsule or case would communicate the explosion to other like capsules or cases.

The term "safety fuze" means a fuze for blasting which burns and does not explode and which does not contain its own means of ignition, and which is of such strength and construction and contains an explosive in such quantity that the burning of such fuze will not communicate laterally with other like fuzes.

The ammunition class has three divisions.

DIVISION 1.

Nobel's Safety Electric Time Fuze.	Safety Cartridges.
Percussion Caps.	Safety Fuzes for blasting.
Railway Fog-Signals.	Safety Electric Fuzes.

DIVISION 2.

Division 2 comprises any ammunition as heretofore defined, which does not contain its own means of ignition, and is not included in Division

Cartridges for Blasting or other like purposes.
 Cartridges for Small Arms which are not Safety Cartridges.
 Cordau Bickford.
 Electric Fuzes.
 Electric Primers.
 Fuze Lighters.
 Instantaneous Fuze.
 Port Fires.
 Tubes for firing Explosives.
 Quick Match.

* In consequence of the results of experiments carried out, it has been decided that a percussion cap can only be properly classed as such if it contains less than 0.6 grain of a composition of the 1st Division of the 5th (Fulminate) class of which not more than 25 per cent consists of fulminate of mercury or less than 0.5 grain of any other explosive of the 1st Division of the 5th (Fulminate) Class, and it has been further decided that percussion caps shall not be classed as such when they contain anvil or have their composition unprotected by tin foil or other suitable substance, as under those circumstances they are liable to explode en masse.



DIVISION 3.

Division 3 comprises any ammunition as heretofore defined which contains its own means of ignition, and is not included in Division 1.

Cartridges for small Arms which are not Safety Cartridges.

Detonators.

Electric Detonators

Friction Tubes.

Nobel's Electric Detonator Time Fuse.

Percussion Primers.

Tubes for firing Explosives.

CLASS 7.—FIREWORK

The term "firework" comprises firework composition and manufactured fireworks.

DIVISION 1 —FIREWORK COMPOSITION.

The term "firework composition" means any chemical compound or mechanically mixed preparation of an explosive or inflammable nature, which is used for the purpose of making manufactured fireworks, and is not included in the former classes of explosives, and also any star and any coloured fire composition subject to the proviso to the definition of manufactured fireworks

Nil.

DIVISION 2.—MANUFACTURED FIREWORKS

MANUFACTURED FIREWORKS, consisting of any explosive of the classes 1, 2, 3, 4 and 6 and any firework composition, when such explosive or composition is enclosed in any case or contrivance or is otherwise manufactured so as to form a squib, cracker including chinese crackers, toy cap or amorce, serpent, rocket (other than a war-rocket), maroon, lance, wheel, Chinese fire, Roman candle, or other article specially adapted for the production of pyrotechnic effects, or pyrotechnic signals, or sound signals

Provided that a substantially constructed and hermetically closed metal case, containing not more than one pound of coloured fire composition of such a nature as not to be liable to spontaneous ignition shall be deemed to be a "manufactured firework" and not a "firework composition."

Aluminium Torches.

Electric Sparklers.

Magnesium Torches

Amorces.

Chinese Crackers

Electric Sparklers

Aluminium Torches

Magnesium Torches

Explosive Caps.

Night Signals.
 Magnesium Torches. }
 Aluminium Torches. }
 Electric Sparklers. }
 Manufactured Fireworks.
 Pyrotechnic Matches.
 Rockets,
 Sparklers.

N. J. SIELDON,
 Chief Inspector of Explosives, India.
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APPENDIX F.

List of petroleum premises licensed during the year 1927.

Presidency or Province	District.	No.	Presidency or Province.	District.	No.
Ajmer-Merwara	Ajmer . . .	20		Brought forward	470
	TOTAL . . .	20		Hooghly . . .	33
Assam	Cachar . . .	13	Bengal	Howrah . . .	42
	Darrang . . .	8		Jalpaiguri . . .	36
	Goalpara . . .	10		Je-sore . . .	1
	Kamrup . . .	22		Khulna . . .	21
	Khasi and Jaintia Hills	4		Malda . . .	0
	Lakhimpur . . .	10		Midnapur . . .	47
	Naga Hills . . .	7		Murshidabad . . .	31
	Nongpung . . .	3		Mymensingh . . .	40
	Sibsagar . . .	32		Nadua . . .	20
	Sylhet . . .	51		Noakhali . . .	12
	TOTAL . . .	168		Pabna . . .	24
Baluchistan	Quetta . . .	20		Rajshahi . . .	35
	Leralai . . .	2		Rangpur . . .	53
	Sibi . . .	1		Tippera . . .	40
	TOTAL . . .	23		24-Parganas . . .	66
Bengal	Pacherganj . . .	32	Bihar and Orissa	TOTAL . . .	976
	Bankura . . .	12		Balasoie . . .	10
	Burhabun . . .	18		Bhagalpur . . .	43
	Bogia . . .	23		Champaran . . .	23
	Burdwan . . .	52		Cuttack . . .	9
	Calcutta . . .	188		Darbhanga . . .	53
	Chitragong . . .	81		Gaya . . .	30
	Dacca . . .	54		Hazaribagh . . .	36
	Darjeeling . . .	23		Manikurn . . .	70
	Dinajpur . . .	11		Monghyr . . .	21
	Faridpur . . .	26		Muzaffarpur . . .	56
	Carried over . . .	470		Carried over . . .	353

*This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance.

APPENDIX F—contd.

List of petroleum premises licensed during the year 1927—contd.

Presidency or Province.	District	No.	Presidency or Province	District	No.
Bihar and Orissa	Brought forward .	352	Bombay	Brought forward	470
	Palamnu	9		Larkana	2
	Patna	56		Nauk	29
	Puri	12		Panch Mahals	11
	Purnea	27		Poona	44
	Ranchi	32		Patnagiri	70
	Sambalpur	10		Satara	12
	Saran	21		Sholapur	16
	Shahabad	17		Sukkur	11
	Singhbhum	33		Surat	22
	Sonthal Parganas .	34		Thana	21
	TOTAL	606		TOTAL	725
Bombay	Aden	18	Burma	Akyab	2
	Ahmedabad	57		Amherst	16
	Ahmednagar	12		Bassien	4
	Belgaum	31		Bhamo	3
	Bijapur	11		Hanthawaddy . .	6
	Bombay	138		Insein	1
	Broach	19		Kyaukse	1
	Dharwar	27		Lower Chindwin .	7
	Hyderabad (Sind) .	8		Magwe	55
	Kaira	35		Mandalay	16
	Karnachi	51		Maubin	8
	East Khandesh . . .	32		Mektila	3
	West Khandesh . . .	10		Mergua	5
	Kolaba	15		Minbu	27
	Kollhapur	6		Myaungmya	13
	Carried over	479		Myingyan	8
				Carried over	175

*This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance

APPENDIX F—contd.

** List of petroleum premises licensed during the year 1937—contd.*

Presidency or Province.	District.	No.	Presidency or Province	Dist-ct.	No.
Burm.	Brought forward	175	Central Pro- vince.	Brought forward	187
	Myittha	7		Dawoh	6
	Northern Shan States	16		Drug	9
	Pakoku	13		Kochangabad	21
	Pegu	7		Jubbulpore	29
	Pyaw	12		Mandla	2
	Rangoon	49		Nagpur	50
	Ruby Mines	3		Narsingpur	6
	Saguing	3		Ninnar (Khandwa)	17
	Satohway	3		Raipur	19
	Southern Shan States	4		Saugor	5
	Tavoy	6		Tenoi	4
	Tharawaddy	2		Wardha	29
	Tholon	1		Yotmal	27
	Thayetmyo	16		TOTAL	416
	Upper Chinthein	3			
	Yamethin	3		Delhi	30
	TOTAL	325		TOTAL	86
Central Pro- vince	Alola	25	Hyderabad	Hydrabad	26
	Amraoti	42		Secunderabad	27
	Belaghat	2		TOTAL	53
	Betul	12			
	Bhandara	29	Madras	Anantapur	15
	Bilaspur	13		Bellary	15
	Buldana	36		Chingleput	20
	Chanda	19		Chittoor	7
	Chhindwara	11		Coimbatore	55
	Carried over	189		Carried over	112

* This list includes installations and godowns for the storage of dangerous and non-dangerous petroleum regarding which this department has cognizance.

APPENDIX F—contd

~ List of petroleum premises licensed during the year 1927—contd.

Presidency or Province	District	No	Presidency or Province	District	No
Madras	Brought forward	113	North-West Frontier Pro- vince.	Huzarn	10
	Cuddapah	11		Kohat	6
	Ganjam	23		Peshawar	35
	Godavari	11		TOTAL	51
	Guntur	32		Anbala	18
	Kistna	49		Amritsar	0
	Kurupol	22		Attock	7
	Madras	61		Dera Ghazi Khan	8
	Madura	41		Ferozpur	6
	Malabar	57		Gujranwala	4
	Nellore	21	Punjab	Gujrat	11
	North Arcot	35		Gurdaspur	28
	The Nilgiris	27		Gurgaon	7
	Ramanad	60		Hasser	17
	Salem	23		Hoshiarpur	7
	South Arcot	30		Jhelum	11
	South Canara	21		Jullunder	21
	Tanjore	78		Kangra	1
	Tinnevely	30		Karnal	26
	Trichuropoly	75		Lahore	45
	Vizagapatnam	36		Ludhiana	11
	TOTAL	834		Lyallpur	6
Mysore	Bangalore	53		Mian Mir	1
	Kolar	3		Multan	9
	TOTAL	36		Patiala	2
				Rawalpindi	50
				Shahpur	14
				Sheikhpura	1
				Sialkot	13
				TOTAL	376

* This list includes installations and godowns for the storage of dangerous and non dangerous petroleum regarding which this department has cognizance.

SUMMARY.

Presidency or Province.	No.
Ajmer-Merwara	20
Assam	169
Baluchistan	23
Bengal	978
Bihar and Orissa	606
Bombay	725
Burma	325
Central Provinces	416
Delhi	36
Hyderabad	53
Madras	834
Mysore	30
North-West Frontier Province	51
Punjab	336
United Provinces	547
TOTAL	5,164

APPENDIX G.

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927.

EXPLOSIVES.

No.	Date of accident	Nature of Explosive	Where accident occurred	Circumstances of accident so far as ascertained	NUMBER OF PERSONS	
					Killed.	Injured.
1	12th Jan 1927.	Gunpowder	Raipur	An explosion occurred while a boy of 18 years, an employee of a licensed manufacturer of fireworks, was pounding gunpowder for preparation of fireworks. The boy was badly burnt and died later.	1	..

APPENDIX G—*contd.*

*Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927—
contd.*

EXPLOSIVES.

No.	Date of accident.	Nature of Explosive	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS	
					Killed	Injured.
2	8th. Apr. 1927	Gunpowder.	Mokprith, Burma.	At about 1.45 p.m. at Quarry No. 3 three holes were plugged with gunny ready for blasting and all men warned to collect their tools and retire. Of the three injured persons one was seen running back. He started to run a drill in an old hole which caused an explosion. He was thrown down and the other two received injuries from flying stones. The drill did not later in hospital.	1	2
3	16th. Apr. 1927.	Do.	Yellagundam.	A man was manufacturing gunpowder in a field. The powder took fire accidentally and he was fatally injured.	1	—
4	29th. Apr. 1927.	Do.	Savara, Rangoon.	On the work of construction of a well a man employed five persons on 28th. April 1927. Three holes were prepared and charged with blasting powder and fired. One charge did not explode. Next morning while the men were emptying the hole for re-filling, the charge went off, possibly from a spark caused by the crow-bar striking against the rock. Two persons were seriously hurt.	—	2
5	10th. May 1927.	Do.	Kannakurichi, Salem	A man was engaged in deepening a well. Three charges were prepared. Two of them exploded but the third did not explode. He went to ascertain the cause when it exploded injuring him above the eye. He died of his injuries the next day.	1	—
6	May 1927.	Do.	Matin, Kottai.	The owner of a gun spread out some gunpowder to dry in the sun. He was smoking near by when a spark from a pipe, a native cigarette, fell upon the powder and set it alight. He was badly burnt about the face.	—	1

APPENDIX G—*contd.*

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927—
contd.

EXPLOSIVES.

No.	Date of accident	Nature of Explosive	Where accident occurred	Circumstances of accident so far as ascertained	Number of persons killed or injured	
					Killed	Injured
7	17th June 1927.	Gunpowder.	Madawada, Bombay.	Six drillers were engaged in blasting rocks in a quarry. Out of the six charges lighted only five exploded. After waiting for about half an hour the men walked towards the unexploded charge. While one of them was examining it, it suddenly exploded injuring him fatally.	1	..
8	10th Oct 1927.	Do.	Ham-nazarpur, Rajpur.	While two labourers were preparing fireworks in a bamboo hut, one of them hit a iron log, which was being used to compress gunpowder, on a piece of stone causing a spark. It ignited the powder and the two men received slight injuries.	..	2
TOTAL					5	7
9	25th May 1927	Dynamite	Chauk Yevang Young.	Two men employed by the Burmah Oil Co.'s contractor died of injuries received from an explosion of Dynamite while blasting near Burmah Oil Co.'s new workshops at Chauk. The explosion was due to inexperience in the handling of explosives.	2	..
TOTAL					8	18
10	13th Oct 1927.	Gelignite	Kyauktalon	A report of the explosion is given in Appendix K.	6	15
TOTAL					8	18
11	21st Jan 1927.	Fulminate.	Ugongo, Belgium.	While a watchman was founding a mixture of potassium chlorate and arsenic sulphide, an explosion occurred injuring him badly. The accused was fined £50.	..	1
12	25th Jan 1927	Do.	Kamudi, Ramnad	An explosion occurred while a person was manufacturing fireworks with chlorate of potash and sulphate of arsenic. He was fatally injured and two other persons were slightly injured.	1	2

APPENDIX G—contd.

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927
—contd.

EXPLOSIVES.

No.	Date of accident	Nature of Explosive.	Where accident occurred	Circumstances of accident as far as ascertained.	NUMBER OF PERSONS.	
					Killed	Injured.
13	3rd Sep 1927.	Emulinate	Calcutta	While a person was endeavouring to break off a piece of some solid substance by means of a wooden mallet and a portion of the metal rib of an umbrella, an explosion occurred resulting in injuries to his hand.	..	1
14	24th Oct. 1927.	Do.	Do.	While a person was mixing powders of potassium chlorate and red arsenic by means of a copper plate, an explosion occurred causing injuries to him. He was convicted and sentenced to pay a fine of Rs. 20.	...	1
15	7th Apr 1927.	Bomb	Lucknow	There was an explosion of a bomb at a Mahomedan religious mela at Lucknow which caused injuries to 18 persons. On analysis of the fragments arsenic was detected in small amounts and traces of potassium and sodium chloride.	...	18
16	13th Apr 1927	Do.	Nagla Jula	A boy while he was playing in his house with a bomb said to have been picked up by him from a field, bent it with a stone. It burst and injured him, two other children and a woman.	...	4
TOTAL					1	22
17	10th May 1927	Ammonium Dinitrate.	Charnaudia	A boy picked up a detonator from a hut where explosives were stored by a contractor for blasting purposes. He rubbed it on a stone when the detonator exploded causing injuries to the boy.	...	1

APPENDIX G—*contd.*

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927
—*contd.*

EXPLOSIVES.

No	Date of accident.	Nature of Explosive	Where accident occurred	Circumstances of accident as far as ascertained	Number of persons.	
					Killed	Injured.
18	21th Oct 1927.	Ammunition Detonator.	Parangmaharajpur	Two persons were given 200 detonators to pack for despatch to Jambhedpur in a bag. One of them had put them into a small wooden box and was hammering down the lid when there was an explosion. He was very seriously injured and died almost immediately. The other person who was looking on was also injured. The cause of the explosion was probably the driving in crooked of a copper nail which struck the detonators.	1	1
19	16th Dec 1927.	Do	Handigarh	Two men engaged by a contractor for blasting were counting a number of detonators from a pile and throwing them into another pile as counted, one of them dropped and detonated firing the remainder. The two persons were seriously injured.	...	2
TOTAL					1	4
20	5th Jan 1927.	Fireworks	Achalpuram, Tanjore.	While a man was preparing Vengayadi with a mixture of chlorate of potash and arsenic sulphide, an explosion occurred causing injuries to him.	...	1
21	22nd Jan 1927	Do	Calcutta	Whilst a fireworks dealer was spreading out some mixture in the sun to dry, an explosion occurred fatally injuring him. On analysis traces of chlorate of potassium were found in the mixture.	1	...
22	12th Feb 1927	Do	Matlabpur, Calcutta.	A licensee for manufactured fireworks while engaged in the preparation of powder for fireworks allowed a spark from his pipe to fall on the powder, which caused an explosion. The licensee received extensive burns and died later.	1	...

APPENDIX G—contd.

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927—
contd.

EXPLOSIVES.

No.	Date of accident.	Nature of Explosive	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS	
					Killed.	Injured.
23	17th Feb 1927	Fireworks	Calcutta	A girl aged 8 years while playing with "Martinique" accidentally set fire to her clothing and received extensive burns. She succumbed to her injuries.	1	...
24	17th Feb. 1927.	Do.	Do.	While a Mahomedan boy was pounding some mixtures on a stone for manufacture of throw-downs for "Suboraynti" festival, an explosion occurred causing injuries to his face and hands.	...	1
25	19th Apl. 1927.	Fireworks Throw-downs.	Cowpore	A man was manufacturing throw-downs in his room when one of them exploded injuring him fatally and causing injuries to his sister.	1	1
26	11th May 1927.	Fireworks	Tiruchal-padi, Pondicherry.	While grinding powder for fireworks in a licensed shop, the powder accidentally caught fire presumably owing to small particles of sand having got mixed up with it. Three persons received injuries, two of whom died later.	2	1
27	14th May 1927.	Do.	Calcutta	A person was preparing fireworks "Potakas" with a mixture of potassium chlorate and arsenic sulphide for the marriage procession of his brother. Two other persons and a boy of the locality were helping him making them when one of the Potakas exploded and injured the boy and another person.	...	2
28	13th Sep. 1927.	Do.	Chumpanancy, Hooghly.	Two men were preparing fireworks when an explosion occurred injuring them and also a boy who was passing by the place of accident. All the three persons were removed to hospital where they died.	3	...

APPENDIX G—contd.

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927—
contd.

EXPLOSIVES.

No	Date of accident.	Nature of Explosive	Where accident occurred	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS	
					Killed	Injured.
31	29th Oct. 1927.	Fireworks	Calcutta	Two persons were preparing fireworks with chlorate of potash, aluminium powder and hot arrowroot when suddenly the powder exploded injuring them. They were removed to hospital for treatment where they died.	2	...
35	23rd Oct 1927	Do	Do	Three persons were engaged in manufacturing a fairly large quantity of fireworks. A girl was with them watching the operations. They were inside a room with a hurricane lantern burning. There was an explosion and four of them were injured. Two died later on in hospital.	2	2
36	31st Oct. 1927	Do.	Do.	A boy was preparing fireworks with a mixture of chlorate of potash and arsenic when the other members of the family were asleep. One of the Cracker's exploded injuring him.	...	1
37	35th Oct 1927	Do.	Do.	A person was injured by an explosion of fireworks which he was preparing. He was removed to the hospital where he died.	1	...
38	25th Oct 1927.	Do.	Do.	Three young men filled an iron pipe with a mixture of arsenic sulphide and potassium chlorate and lighted it with a match when an explosion occurred, as a result of which one of them was injured.	...	1
39	26th Oct. 1927.	Do.	Do.	A man was preparing fireworks on a footpath, when an explosion occurred owing to rough handling. The man was severely burnt and removed to hospital.	...	1
40	26th Oct. 1927.	Do	Bhandak	A boy aged about 18 years was found exploding balls made up of a mixture of potash and arsenic. Two balls were seized from the boy. He was prosecuted and fined Rs. 10 by the Tahsildar, Warora.	...	...

APPENDIX G--contd

Accidents of passenger aircraft have been brought to the notice of the Transport Department from 1st January 1957 to 31st December 1957--
contd.

TABLE III.

No.	Date of accident.	Name of aircraft.	Where accident occurred.	Description of the accident.	Persons involved.	
					Killed.	Injured.
41	20th Nov 1957.	Boeing 707.	Malaya.	At about 11.15 a Boeing 707 aircraft, registration G-APEX, was on a flight from London Heathrow to Singapore. It was on a scheduled flight and was carrying 100 passengers and 6 crew members.	1	1
42	21st Dec 1957.	De Havilland D.H. 103.	India.	Two passengers were injured by a De Havilland D.H. 103 aircraft, registration G-APEX, which was on a flight from London Heathrow to Singapore. It was on a scheduled flight and was carrying 100 passengers and 6 crew members.	2	2
Total.					16	23

APPENDIX G—contd

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927—
contd.

PETROLEUM.

No	Date of accident.	Nature of Oil.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
1	4th Jan 1927	Petrol	Bombay	While a motor car tank was being filled from a kerbside pump, the tank suddenly caught fire. The car was damaged and the man in charge of the pump got his right fore arm burnt. This fire is believed to be due to someone having thrown a lighted cigarette end.	...	1
2	18th Jan 1927.	Petroleum.	Scari Bunder, Bombay.	Barge No. 5803 had been loaded with petrol and lubricating oils in barrels and was left in charge of his Khaleesi by the Hindil and owner. Meanwhile the Khaleesi also left the barge leaving two boys in charge. One of the boys was seated on the after-part of the barge, watching the other who was playing on the wharf. There was a sudden explosion and a force shot up from the barge and the boy in trying to run to the wharf was burnt on the face, hand, and legs. The fire engine proceeded to the scene and started operations when the tide came in and petrol cans started floating in the bunder. The police ordered the other barges nearby to get out to the sea. One of the crew of another Frun or barge No. 227 loaded with kerosene oil tins, etc., picked up a petrol can and concealed it under the sails. After the barge had come a distance of about 500 yards, an explosion occurred amongst the kerosene oil tins and the barge burst into flames. The damage by fire and water to both barges is estimated to be over Rs 7,000.	...	1

APPENDIX G—contd.

Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1927 to 31st December 1927—contd

PETROLEUM.

No	Date of accident	Nature of Oil	Where accident occurred	Circumstances of accident as far as ascertained	NUMBER OF PERSONS	
					Killed	Injured
3	25th Jan. 1927.	Petrol	Shillong	One Miss Cartwright was cleaning her clothes with petrol in a bath room in Chamere hotel, when the vapour caught fire from a fire in the next room and the petrol can exploded. Her clothes caught fire and she received extensive burns all over the body as a result of which she died the day following	1	...
4	4th Feb 1927.	Do	Calcutta	An elderly European lady ordered her washerman to clean her blanket with petrol in her bath room. While the washerman was at work, the lady struck a match in order to obtain hot water from a geyser. Immediately there was a blaze and she was severely burnt and succumbed to her injuries. The washerman also received burns on legs, hands, etc	1	1
5	12th Mar. 1927	Do	Wadi	A wagon containing 1,000 petrol tins caught fire while being unloaded. The fire was caused through a hand lamp being taken into the wagon. It resulted in the death of two persons and injuries to 3 other railway employees	2	3
6	3rd May 1927.	Do	Bombay	A man took a candle with him and placed it near the tank of a lorry. He then proceeded to pour petrol from a can into the tank and the petrol caught fire. He was badly burnt and died later.	1	..
7	19th July 1927.	Do	Dacca	A fire broke out in the Petrol godown of the Presidency Motor Car Coy at 5 45 P.M. and continued till about 10 A.M. next day. The godown contained 2,682 cans of petrol which were all burnt. The godown was locked up at the time of fire. The cause of the fire is unknown	...	...

APPENDIX G—contd

*Accidents by fire or explosion which have been brought to the notice of the
Explosives Department from 1st January 1927 to 31st December
1927—contd.*

PETROLEUM

No	Date of accident	Nature of Oil	Where accident occurred	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS	
					Killed	Injured.
8	21st Aug. 1927.	Petrol	Chikutta	At about 7 P.M. a motor lorry came to the shop of Mukherjee & Co at Cornwallis Street for one gallon of petrol. The servant of the shop was supplying out of the lorry. The lorry was standing at a 6 yards away from the pump suddenly the servant heard a sound and saw flames at or above the mouth of the tank of the lorry. As the tube of the pump was still inside the tank, he gave a pull to draw it out when burning oil fell upon his clothes and he got burnt. The cause of the fire is unknown.	..	1
9	28th Nov 1927.	Do	Do	A driver stopped his taxi opposite the kerb-side pump of Messrs Dutta Mandal & Co. at No 2 Central Avenue and the Darman of the company connected the pipe with the tank of the taxi to put in one gallon of petrol. When the driver was taking out the pipe from the tank, the petrol in the pipe suddenly caught fire and burnt the Darman's legs.	...	1
Total					2	2

APPENDIX I.

Detailed statement showing the number of accidents and persons killed and injured during the ten years ending 1927..

Year.	GUNPOWDER			DYNAMITE AND OTHER NITRO-COMPOUND BLASTING EXPLOSIVES.			CHLORATE MIXTURE			FUMIGATES.			AMMUNITION.			FIREWORKS.		
	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.	Number of accidents.	Persons killed.	Persons injured.
1918	4	12	2	1	1	8	..	..	..	..	..	..	1	4	2	1	1	..
1919	5	8	16	1	1	9	..	..	..	..	..	..	..	..	..	4	1	18
1920	8	4	11	..	..	..	..	..	21	3	9	21	6	1	9	2	4	1
1921	5	7	1	1	3	15	..	..	6	4	2	6	1	1	3	6	7	11
1922	4	7	7	..	..	..	1	1	5	3	2	5	1	..	1	1	..	1
1923	17	16	19	..	..	..	..	..	16	5	9	16	6	..	7	0	18	15
1924	7	27	11	1	1	..	..	..	7	1	1	7	..	..	..	17	14	12
1925	9	19	11	3	2	11	..	..	10	8	..	10	3	..	17	13	9	9
1926	2	27	28	1	..	2	..	..	23	12	5	23	2	..	7	16	20	34
1927	8	5	7	2	8	18	..	..	22	6	1	22	3	1	4	23	16	20
TOTAL	76	152	127	16	16	63	1	1	110	49	32	110	28	7	51	89	10	121
AVERAGE	8	15	13	2	2	6	1	1	11	5	3	11	3	1	5	9	9	12

APPENDIX I—*concl.*

Detailed statement showing the number of accidents and persons killed and injured during the ten years ending 1927—concl.

Year	PETROLEUM			CHEMICALS			MISCELLANEOUS		
	Number of accidents	Persons killed	Persons injured	Number of accidents	Persons killed	Persons injured	Number of accidents	Persons killed	Persons injured
1918	13	26	17	2	1	6	4	1	1
1919	12	16	50	1	5		3	2	2
1920	22	7	11	1	1	8			
1921	7	6	20				2	4	2
1922	10	8	2				12	12	4
1923	8	5	11				12	1	1
1924	8	6	8	2	3	5	12	3	
1925	8	6	16	2		10	3		1
1926	6	5	18				3		8
1927	9	5	8	2		0	1		
TOTAL	103	93	163	10	10	37	22	18	19
AVERAGE	10	9	16	1	1	4	2	1	2

APPENDIX J.

Comparative statement showing the number of accidents and persons killed and injured during the ten years ending 1927.

Year.	ACCIDENTS CAUSING LOSS OF LIFE OR BODILY INJURY.			Accidents not causing loss of life or bodily injury.	Total number of accidents.
	Number of accidents.	NUMBER OF PERSONS			
		Killed	Injured		
1918	29	48	39	3	32
1919	23	32	45	6	29
1920	32	26	61	10	42
1921	27	32	61	2	29
1922	21	20	20	1	22
1923	30	60	60	5	35
1924	40	55	43	3	43
1925	35	74	81	4	49
1926	49	37	123	..	49
1927	49	33	89	5	54
TOTAL	354	411	691	39	393
AVERAGE	35	41	69	4	37

APPENDIX K.

Letter No. G-1 (117), dated 2nd November 1927, from the Chief Inspector of Explosives in India, to the Secretary to the Government of Burma, Judicial Department, Rangoon.

KYAUKTALON EXPLOSION.

In accordance with the request contained in your telegram No. 500-V., dated 19th October 1927, I have the honour to report that I inspected the site of the explosion and the magazine on the 25th October 1927 in the company of the Extra Assistant Commissioner and Sub-Divisional Magistrate, Amherst.

II. The Extra Assistant Commissioner lent me the proceedings of his enquiry and these I studied before the inspection.

III. From these proceedings the following would appear to be the course of events on the morning of the 25th October 1927.

1. The Blasting Jemadar attended the magazine and took away 15 lbs., that is, 3 boxes of gelignite and a small supply of detonators. The exact number of these taken does not appear to be very clear. He also took some lengths of fuse. These explosives were placed in a wooden box provided with a wooden handle and were conveyed by hand to the centre of the quarry.

2. The Jemadar then squatted down on the ground, not in the usual place under a small sun shade made of boughs and leaves, but out in the open. There was no sun that day. There was a railway engine under steam using wood fuel standing about 40 yards away.

3. The Jemadar then proceeded to cut lengths of fuse and inserted these into detonators fastening the fuse by biting the top rim with his teeth. He did not use nippers. A pair of nippers was seen by me in the magazine when I inspected the latter later on.

4. A large number of men were standing round the Jemadar waiting to receive their gelignite cartridges each fitted with a detonator and fuse. They appear to have been using three or four cartridges in each bore hole.

5. It appears to have been the custom to allow the men to pick the cartridges required by them out of the cardboard boxes and one of these each man handed to the Jemadar for him to fit with a detonator and fuse.

6. There is now a discrepancy in the evidence. One witness says that the Jemadar only cut a length of fuse and attached a detonator to it as each gelignite cartridge was handed to him to be completed, but this appears to be wrong, for I was shown nine lengths of fuse with nine detonators already attached, which were found scattered around the spot where the explosion occurred and the detonators were unexploded. The Jemadar must have prepared the full necessary supply of lengths of fuse with detonators attached before he commenced fitting these to gelignite cartridges. No other spare detonators or lengths of fuse were reported as being found after the explosion.

7. The Jemadar now appears to have completed at least six cartridges, for witnesses say that they received these and walked away from the place just before the explosion occurred. They also say that they have handed these back again to the magazine keeper. This the magazine keeper denies.

8 We now have the following probable position. The Jemadar is seated on the ground. By his side, I fancy the right, is the wooden box containing the bulk of the gelignite. Probably on his left and on the ground is a bundle of at least nine fuses with detonators fitted. Round about him are standing or seated many men and some of them are holding cartridges of gelignite. It seems that the Jemadar is the only person present who is wearing boots.

9. The explosion then occurred.

10. An explosion could have been occasioned by any of the following causes:—

- (a) The friction caused by the Jemadar pushing a length of fuse too far into a detonator.
- (b) A detonator exploding in the Jemadar's mouth whilst he was biting it to fasten it to a fuse.
- (c) The Jemadar roughly placing on the ground a detonator fitted with a length of fuse.
- (d) Somebody treading on a detonator in the bundle of fuses ready fitted with detonators.
- (e) The Jemadar picking up too quickly from his left hand side a length of fuse fitted with a detonator and striking it against the box containing the gelignite cartridges on his right hand side.
- (f) Somebody dropping a cartridge on the ground or into the box of cartridges.
- (g) A spark from the engine falling on the bundle of detonators fitted with fuse.
- (h) A spark from the engine falling on the box of cartridges.
- (i) A spark from somebody smoking falling on the bundle of detonators fitted with fuses.
- (j) A spark from somebody smoking falling on the box of cartridges.
- (k) A spark from the engine or any body smoking falling on one or more cartridges in the hand of a person present. Any lengths of spare fuse lying about need not be taken into consideration as a means of initial ignition as the Jemadar would have ample time to snatch them away before explosion would have occurred.

11. Before going any further it is necessary to point out the curious fact that nine unexploded detonators attached to lengths of fuse are reported to have been found after the explosion, scattered just around the place of the explosion and within two yards of the centre of the crater formed by the explosion. Taking the source of the evidence into consideration I believe it to be true and the only way of accounting for the non-exploding of these detonators is that they were shielded from the main explosion by the body of the Jemadar. The bundle of nine or more fuses and detonators must have been behind him on his left side. If some of these detonators had exploded, they would all have exploded and even then only have slightly wounded one or two persons present. We have seen that they did not explode.

12. Causes (a) and (b) we can rule out as I understand the Jemadar's jaw was not completely blown away and also he had a bundle of fusing and detonators ready made up.

Causes (e), (d), (g) and (i) we can also rule out as we have seen that at least nine detonators in the bundle never exploded as they would have if one had gone off.

Cause (e) is in my opinion the one which brought about the explosion.

Cause (f) would not have exploded the cartridges as gelignite is very soft, especially in India.

Causes (h) and (j)—If a spark had fallen on the gelignite cartridges, they would first have flared up and after a second or so they would have exploded. None of the witnesses speak of a preliminary flare before explosion. We can rule these out.

Cause (k) we can rule out as I do not believe the main bulk of the explosive on the ground would have gone off. The man himself would have been killed but not so many as actually were.

13. The cause of the explosion was in my opinion the striking of a detonator on the end of a length of fuse against the box containing the bulk of gelignite cartridges.

14. The following procedure should be observed in future:—

(a) Each detonator should only be fitted to its fuse just before it is pushed into an explosive cartridge. Detonators should never be fitted to lengths of fuse until actually required.

(b) This fitting of detonators to fuse and detonators to cartridges should be done in a small clean hut into which no other person than the Jemadar or Jemadars should be allowed. No person other than the Jemadar or Jemadars should be permitted to touch any explosive and all loading of bore holes must be done by the Jemadar or Jemadars.

(c) No smoking or steam locomotive should be allowed in the whole quarry during the time allotted to cartridge preparing and shot firing.

(d) Cartridges shall not be carried away from the magazine to the quarry in the same box as the detonators. Two carrying boxes should be provided, one for cartridges and one for detonators and fuse.

(e) The Rules for Blasting, six copies of which are enclosed, should be strictly followed in the future.

APPENDIX L.

Instructions for testing electric earths attached to Petroleum Tanks.

1 First, examine visually all joints and connections above ground to discover if any of these are loose or disconnected.

2. The electrical test should be carried out in the dry season. If using the electric bell type of machine, attach one end of a covered wire A to one of the terminals on the machine and press the other end on a suitable point of the tank first having scraped the paint and exposed clean metal. Use a piece of wood to protect the hand from electric shock. Attach another wire B to the remaining terminal on the machine, its free end being buried to a depth of about one inch in the ground about two yards away from the point where the earthing ribbon or pipe to which the earthing ribbon is attached enters the earth. Pour about one pint of water on the ground where the wire B is buried. Now see if the bell will ring, if the handle of the machine is turned.

3. Should a bell type machine not be available, an ordinary electric bell in series with two Leclanche batteries, also in series, will serve the purpose. In this case wire A is attached to one terminal of the bell and wire B to one terminal of the battery, the remaining terminals of bell and batteries being correctly connected together. The free end of wire B is in this case not buried in the ground but pressed on to the lowest point visible on the earthing ribbon and the free end of wire A pressed on a suitable point of the tank as above.

4 If the bell will not ring, look for loose joints. See if the bell will ring when the end of wire A is pressed in contact with the lowest point visible on the earthing ribbon.

5 The electric earth is not in order unless the bell rings clearly when tested as in paragraphs 2 and 3 above.

6 Never press wire A or B in contact with any part of a tank where petrol vapour is likely to be present.

7. When using testing sets which measure the actual resistance, proceed as laid down in "Code of Instructions for the Guidance of Public Works Officers in the Erection and Testing of Lighting Conductors." (Manager, Government of India Press, Calcutta).

The result of the test should not be considered satisfactory until the resistance of the earth is found to be less than 10 Ohms.

Table IV—continued

41

APPENDIX H.

Summary of accidents during the year 1927.

Explosives or dangerous and inflammable substances.	ACCIDENTS CAUSING LOSS OF LIFE AND BODILY INJURY.			Accidents not causing loss of life or bodily injury.	Total number of accidents.
	Number of accidents	NUMBER OF PERSONS			
		Killed	Injured		
Explosives.					
Gunpowder	8	5	7	...	8
Nitro-compounds	2	8	18	...	2
Chlorate Mixture . . . .	...	...	...	...	...
Fulminates	6	1	22	...	6
Ammonium	3	1	4	...	3
Fireworks	20	18	22	2	22
TOTAL	39	51	71	3	42
Petroleum.					
Petroleum Generally . . .	8	5	8	1	9
TOTAL	8	5	8	1	9
Chemicals	2	...	9	...	2
TOTAL	2	...	9	...	2
Miscellaneous . . . . .	...	...	...	1	1
TOTAL . . . . .	...	...	...	1	1
GRAND TOTAL	49	56	89	5	54

in the statements of the various States, and in the reports of the various departments, for which separate headings are provided in the crop statements, are distributed in the maps of which they are composed.

Some of the land planted with food-grains wheat, barley, etc., mixed with oil-seeds as shown under food-grains which was really planted with oil-seeds (as a mixed crop) is roughly estimated from the reports of Area and Cereals in 1920-21.

(Notes on pages 24 and 25 for Rabarbar, Muesling and Hameln)